
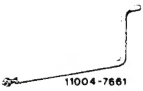
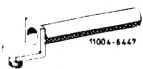
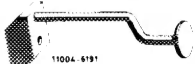
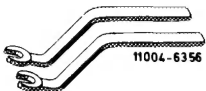

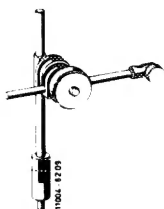
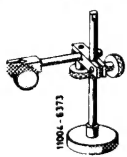


Valve clearance	engine cold (approx. 20 °C)	engine hot (60 °C ± 15 °C)
Intake	0.10 <sup>1)</sup>	0.15 <sup>1)</sup>
Exhaust	0.30	0.35

1) 0.05 mm greater for steady ambient temperatures below -20 °C.

Tightening torques	Nm	(kpm)
Bolts for cylinder head cover (engine 615)	5	(0.5)
Nuts for cylinder head cover (engines 615, 616, 617)	15	(1.5)

### Special tools

Socket 27 mm, 1/2" drive to crank engine		001 589 65 09 00
Measuring extension		123 589 09 63 00
Locking fixture for adjusting slide		116 589 19 21 00
Installer for valve stem seals		617 589 00 43 00
Valve adjusting wrench 14 mm (two)		615 589 00 01 00
Holding wrench for valve spring cap		615 589 00 03 00
Dial gauge holder		121 589 00 21 00
Magnetic dial gauge holder		116 589 12 21 00

### Note

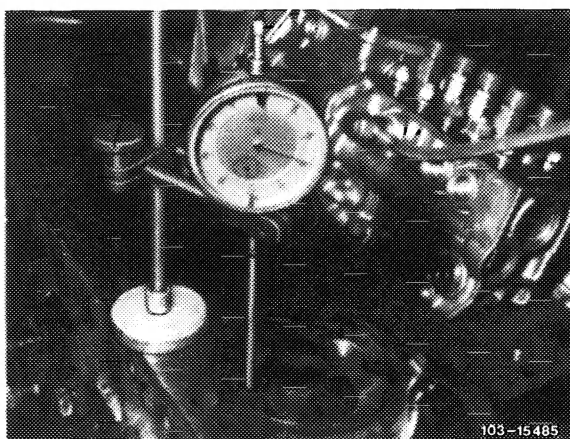
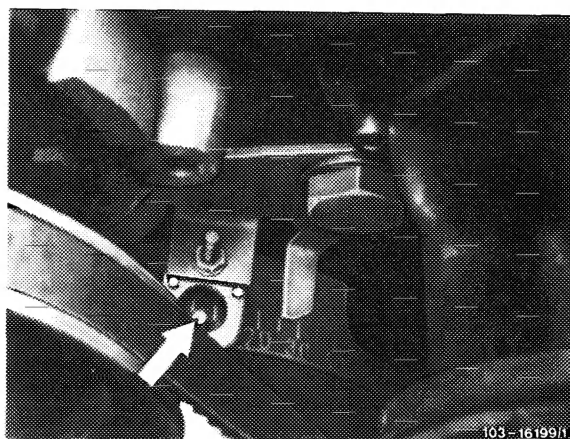
With the crankshaft positioned at  $20^\circ$  after TDC, the pin in vibration damper must be located directly beneath TDC transmitter adjusting slide (arrow).

Adjusting slide setting needs checking and correcting:

- a) When replacing the adjusting slide.
- b) When replacing crankshaft together with balance plate and vibration damper.
- c) When completing partial engines.

Having detached cylinder head, position dial gauge contact button directly on piston crown. To do so, attach magnetic dial gauge holder to crankcase parting surface.

To correct adjusting slide, now proceed in accordance with operations 6, 13 and 16–22.



### Checking

- 1 Remove radiator shroud.
- 2 Remove fan.
- 3 Remove V-belts of power steering pump and refrigeration compressor (13–340).

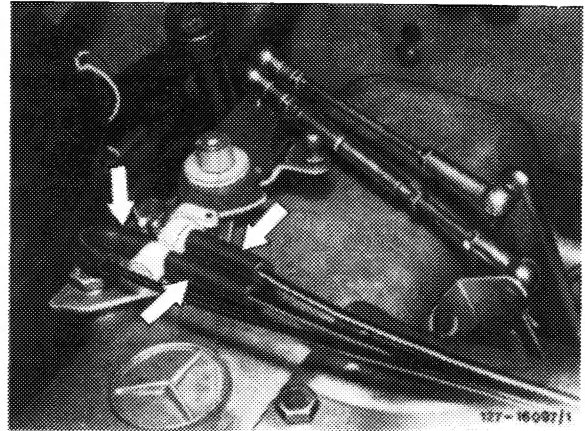
4 Remove cylinder head cover.

For models with automatic transmissions and vacuum-controlled modulating pressure, detach vacuum lines at switch-over valve.

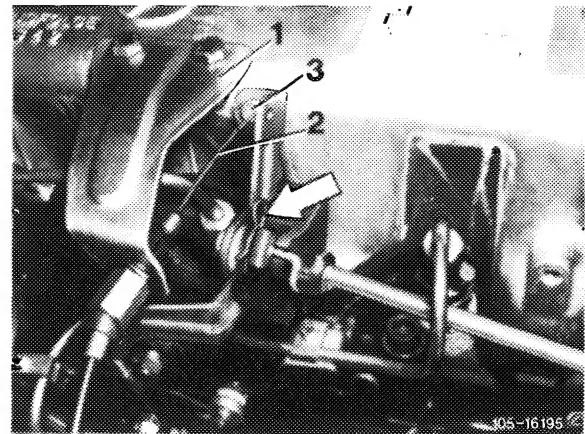
**Caution:**

Be sure not to cross vacuum lines.

The connecting sockets and vacuum lines are color coded.



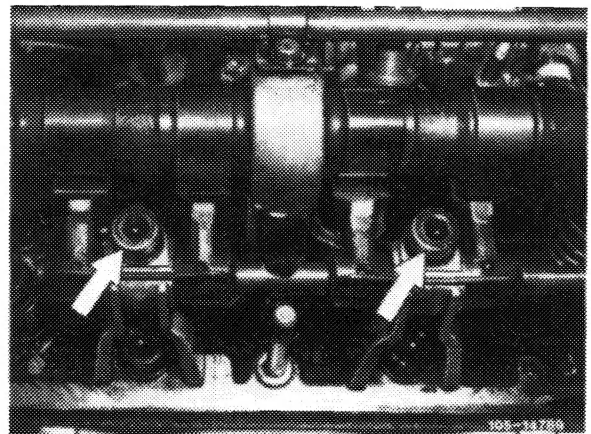
On engines with longitudinal control spindles, unhook all control rods. Withdraw retainer (arrow) and force longitudinal control spindle in aft direction. Unscrew bracket (1) and unclip idle control cable (2) with plastic sleeve (3).



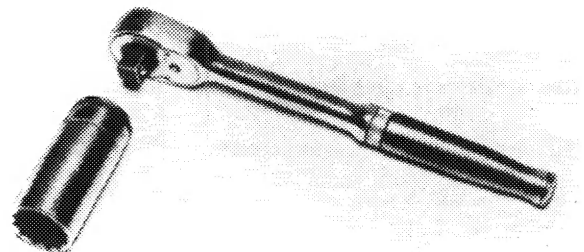
5 Remove front rocker arm assembly, positioning camshaft so that rocker arms are free.

**Caution:**

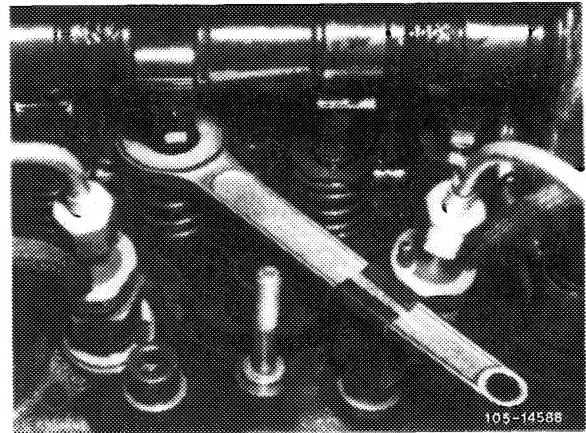
Engine must not be cranked at camshaft, but at crankshaft using tool combination.



6 Set No. 1 cylinder piston to TDC, turning crankshaft with tool combination.

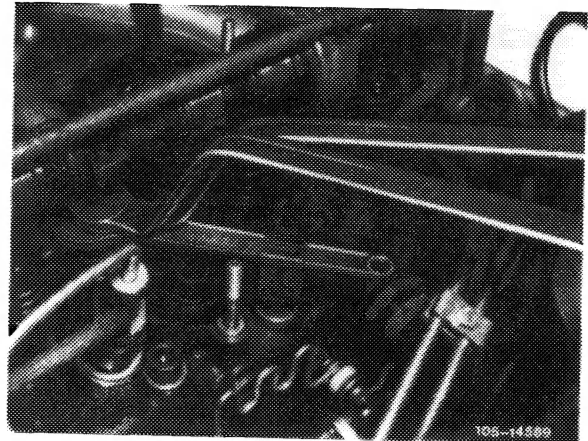
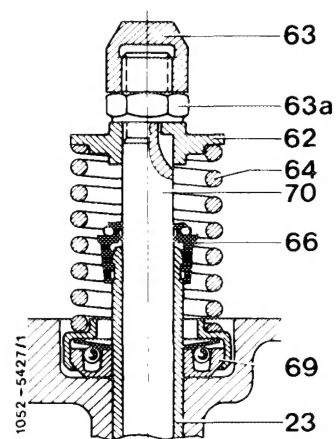


7 Apply holding wrench to hexagon section of valve spring cap, doing so at intake valve of No. 1 cylinder.



8 Unscrew cap nut (63), using valve adjusting wrench. Secure lock-nut (63a) with second valve adjusting wrench.

9 Unscrew lock-nut (63a).



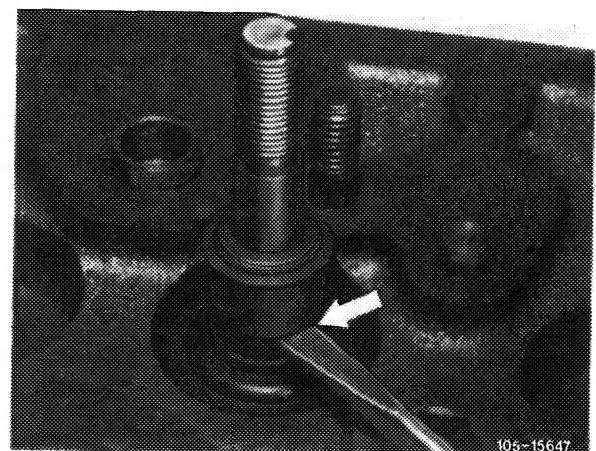
10 Remove valve spring cap and valve spring.

11 Detach valve stem seal, using screwdriver or pliers.

**Caution:**

Do not damage valve stem or valve guide.

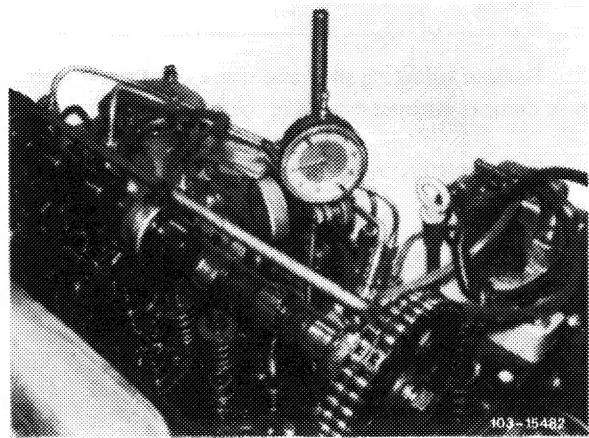
12 Press valve onto piston crown.



13 Turn crankshaft back by about  $10^{\circ}$ , using tool combination.

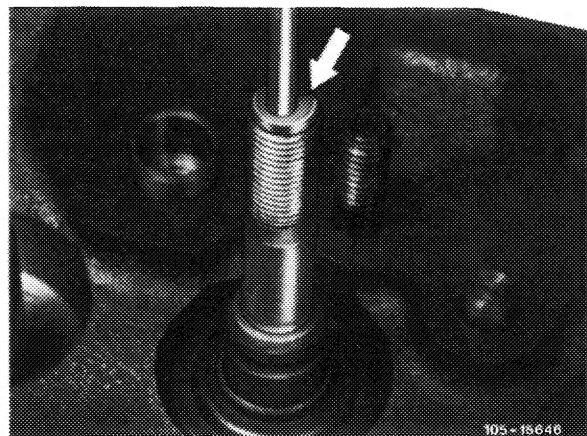
14 Screw threaded sleeve of dial gauge holder onto stud in cylinder head.

15 Insert dial gauge and attach arm to dial gauge.



16 Position dial gauge arm on valve stem, applying 2 mm preloading.

17 Using tool combination, slowly turn crankshaft in normal direction until large pointer of dial gauge comes to a standstill (TDC position).



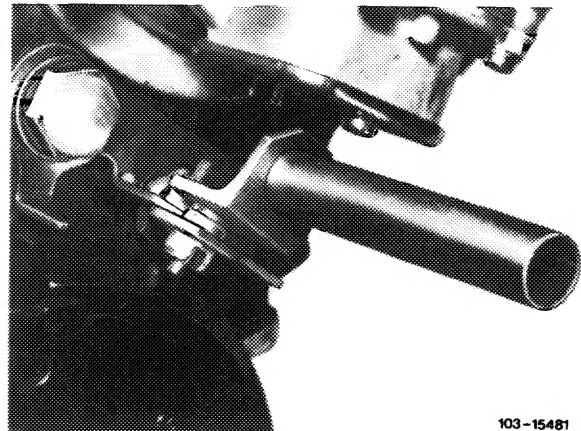
18 Release dial gauge and locate arm on valve stem, applying 5 mm preloading. Turn dial gauge scale until large pointer is on zero.

19 Using tool combination, slowly turn crankshaft in normal direction until dial gauge drops by 3.63 mm.

20 Position locking fixture in adjusting slide.

Pin in vibration damper must engage groove on locking fixture.

Correct position of adjusting slide if pin fails to latch.

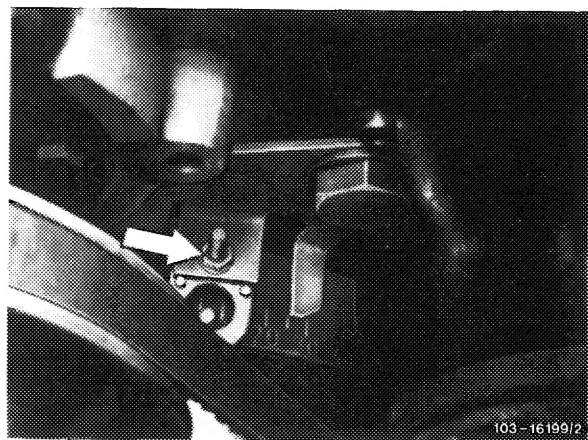


### Correcting

21 Release adjusting slide and move until pin in vibration damper engages groove in locking fixture.

22 Tighten adjusting slide and withdraw locking fixture.

23 Remove dial gauge and unscrew dial gauge holder.

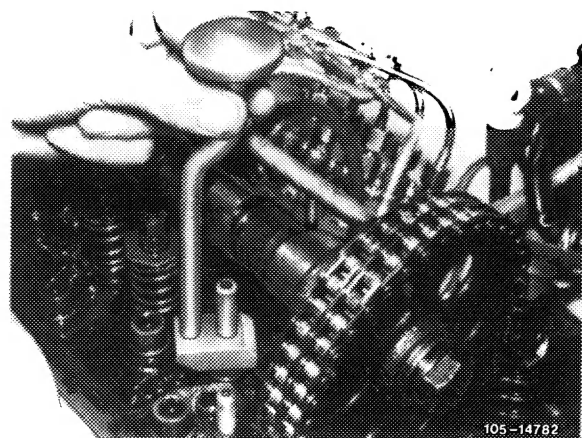


24 Oil new valve stem seal and install using drift. Position sleeve on valve stem for this purpose.

25 Install valve spring and rocker arm assembly.

26 Check valve clearance (05-210).

27 Attach cylinder head cover.



28 Position and tighten V-belts of power steering pump and refrigeration compressor (13-340).

29 Attach fan and radiator shroud.